LBNE Project Risk Management

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LBNE Risk Manager

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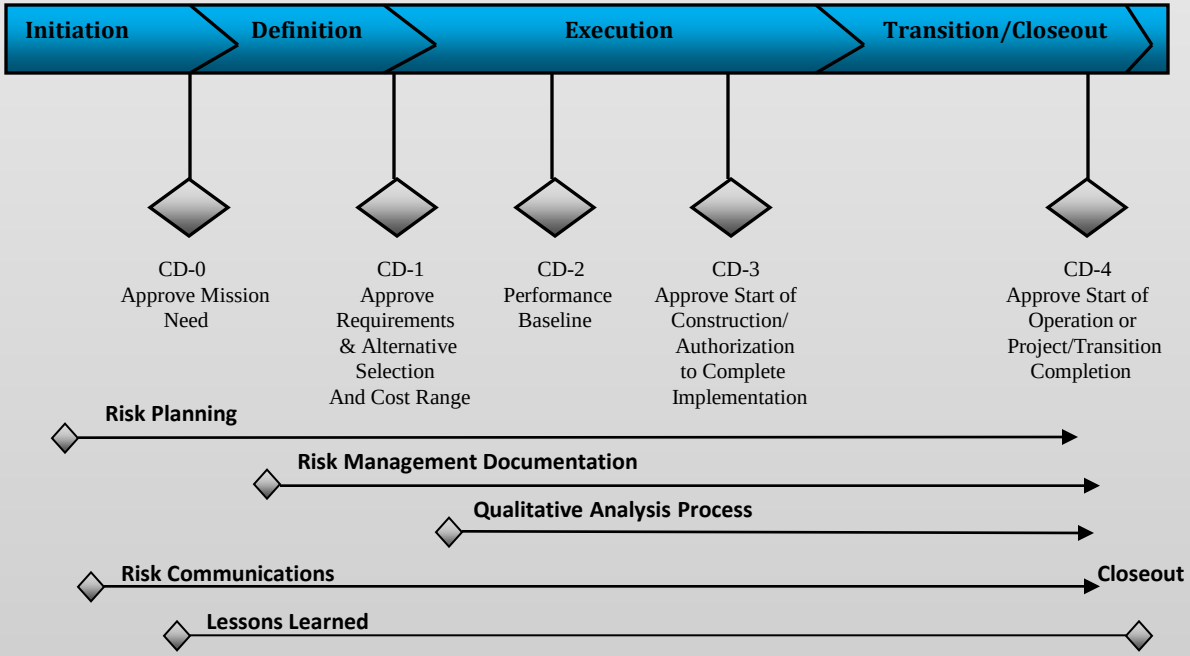
Key Elements of Risk Management

1. Risk Planning
2. Risk Identification
3. Qualitative Risk Analysis
4. Quantitative Risk Analysis
5. Risk Handling and Mitigation Strategies
6. Risk Monitoring

Risk Management During CD Phases



Iterative process that needs to be continuous throughout the project life cycle

Roles and Responsibilities Overview

Project Manager – Establish risk guidelines for identification and analysis, schedule project risk meetings, ensure mitigation strategies are implemented properly. Perform top down risk identification.

Risk Manager – Bring identified risks together into risk register, work with subprojects to facilitate effective risk identification, analysis, and mitigation, Monte Carlo analysis.

L2 Manager – Identify risk owners, manage mitigation strategies for subsystem, schedule periodic risk review, communicate risks with risk manager and Project Manager.

L3 + L4 Managers – Identify risks (bottoms-up), assess identified risks and the resulting impacts, develop mitigation strategies, assess post-mitigated risk impact, document basis for impact on cost, schedule, technical, or ES&H, document findings as related to WBS number, continually reassess risks and identify any new risks as they become apparent. Solicit vendor and sub-contractor risk and incorporate into risk planning

Types of Risk

Known-Unknowns – things we know exist but, do not know how they will effect the project. An identifiable uncertainty. (Management Reserve)

Examples: Oil prices increase, Budget delayed, Manufacturer has layoffs, safety, Design margins

Unknown-Unknown – an item or situation whose existence we cannot anticipate. (Available Contingency)

Examples: Natural disasters, Supplier closes doors

First Steps

- Need to talk about risk in groups.
- Identify what worries us (must be upfront because failure to identify or disclose a risk may have the potential to derail or even have the project cancelled)
- Document the worries
- Identify risks between handoffs of subsystem integration and subproject interfaces.
- Everything else will fall into place moving forward, the project office will work closely with all to ensure the process is as easy as possible.

Documentation

- Risk Management Plan – Sets the guidelines for dealing with risk in the project and parameters for analyzing risk. (Written by the Project Office)
- Risk Forms – Will be filled out by risk owners or identifiers to identify each risk individually. (Form will be distributed by the Risk Manager)
- Risk Register – After risks have been properly identified (risk form) with their triggers (mitigation plans will be developed later) they are recorded in one database containing all of the identified risks. (Controlled by the Risk Manager)

Qualitative Risk Analysis

Qualitative analysis is the process of adequately characterizing risk in words so as to initiate the development of an appropriate risk handling strategy. Additionally, qualitative analysis allows for an assigned risk rating for each risk, which enables a risk grouping process to occur.

Qualitative Risk Threat Analysis Matrix

Probability Scale

Low	Medium	High
Up to 25%	>25%	>75%

Impact Scales and Types

THREATS	Negligible	Low	Medium	High
Schedule (Delays Level 3 milestone or project critical path by) *	No Schedule Delay	1 day to 2 Months	> 2 Months	> 6 Months
Cost*	No Cost Impact	$.01 - $1,000,000	> $1,000,000	> $5,000,000
Scope*	No degradation.	Minor degradation. Performance falls below upper end of goal.	Significant degradation. Performance falls below Mid-Range goal.	Severely degraded. A change in scope that affects the ability to satisfy the mission need to achieve CD-4.
ES&H and Quality*	No Impact	Minimal	Concern	Significant Applications Affected

Opportunity Risk Analysis

- Risks can be positive and not just negative.
- These risks will have a positive impact on the project.
- Harder to identify and fewer in definition but must be addressed just the same.

Examples:

Early procurement will decrease a lag in schedule, Having an existing wafer board upgraded early so that a redesign is not necessary if a company is planning a re-tooling that does not support existing specs (Schedule, Cost).

Qualitative Opportunity Risk Analysis Matrix

- Use the same matrix only viewing each category as an opportunity and a value to the project.

OPPORTUNITIES	Negligible	Low	Medium	High
Schedule (Improves Level 3 milestone or project critical path by) *	No Schedule Increase	1 day to 2 Months	>2 months	>6 months
Cost (Improvement / savings)*	No Cost Impact	$.01 - $1,000,000	>$1,000,000	>$5,000,000
Scope (Improvement)*	No Improvement.	Minor Improvement.	Significant improvement.	Major Improvement
ES&H and Quality*	No Impact	Minimal Improvement	Moderate Improvement	Significant Applications Improved

Specific Roles for Qualitative Analysis

- All owners and identifiers of risk will perform a qualitative analysis on their risks using matrices supplied by the Project. They will then document this on a risk identification form (including all fields) that will be supplied by the project management team.
- Risk Manager will coordinate efforts and combine all records of risk for further analysis.
- Risk Manager will group risks accordingly and enter into preliminary Risk Register.

Documentation

LBNE Risk Form (Example)

(Blank form posted in Fermi Docdb document 375)

Risk		
ID	**Type**	**Title**
PM-1.1	Threat	DOE Funding Delayed (CR) in FY 2011 for LBNE

Documentation

LBNE Risk Form(Example)

Pre-mitigation					
Probability	**Schedule (Delays major milestone or project critical path by) in days**	**Cost**	**Scope**	**ES&H and Quality**	**Score**
H	M	L	L	L	

Documentation

LBNE Risk Form(Example)

Response		
Type	**Title**	**Total Cost**
Accept	Use Available reserves. Delay and /or cut costs.	$.00

Documentation

LBNE Risk Form(Example)

Details												
Owner	**Cause**	**Description**	**Effect**	**RBS**	**Status**	**Manageability**	**Proximity**	**Start Date**	**End Date**	**Exposure**	**Quantifiable Risk**	**Quantified**
Strait	Continuing Resolution	There is a risk that funding is delayed due to a CR.	CD Review is pushed forward. Schedules slip. Contracts delayed.	External-funding				01 Oct 2010	30 Sep 2011			

Documentation

LBNE Risk Form(Example)

User Defined					
WBS Number	**Other WBS Impacted**	**Risk Type (Cost, Schedule, Scope, ES&H and Quality)**	**Risk Identifier**	**Additional Notes**	**Notes**
1.1	1.2,1.3,1.4,1.5,1.6	Schedule,Cost	Jim Strait		

Documentation Process

After all risks have been identified each L3 manager will assemble risks associated with their WBS element.

- The L2's and L3's will then email their compiled risk form to the Risk Manager.
- The Risk Manager will compile the risks for each Sub-Project and schedule a meeting to discuss the overall risks.
- Then all Sub-Projects will be combined for an LBNE list which will be discussed with the Project Manager and Risk Management Board.
- After approval, analysis will be done to determine which risks require a mitigation strategy.
- If a mitigation strategy is needed, the Risk Manager will notify the risk owner and work closely with them to understand what steps will be needed and help to assign the appropriate Management Reserve while relaying the strategy to the L2's and the PM.

Risk Forms

- We would like to have all risk forms in by July 6th so that proper assessments can be made and all risks properly ranked and approved.

Monte Carlo Analysis

- Used by the risk manager and/or Project Controls on data supplied by the risk owners/identifiers from all subprojects to determine probabilities of achieving project objectives while managing risks.
- Identifies risks requiring the most attention by the use of simulation (critical path analysis).
- Quantify project risk exposure and help determine the size of cost & schedule management reserve.
- Quantitative risk analysis outputs will determine a realistic contingency plan for higher risks.
- Outputs will generate graphs and sensitivity analysis for use in CD review process to justify reserve amounts.
- Key tool to forecast risks and eliminate most uncertainty using statistics and expert data.

Primavera Risk Analysis

DEMONSTRATION